

WHAT IS CLAIMED IS:

1. A manufacturing method of a polycide gate, comprising steps of:
 - (a) providing a substrate;
 - (b) forming a polysilicon layer and a silicide layer upon said substrate;
 - (c) removing a part of said silicide layer for defining a silicide structure having a side wall;
 - (d) forming a protecting structure covering said side wall of said silicide structure;
 - (e) removing said polysilicon layer not covered by said silicide structure and said protecting structure for obtaining a polysilicon structure having laterals; and
 - (f) oxidizing said polysilicon structure for forming an insulating structure on laterals of said polysilicon structure.
2. The manufacturing method as claimed in claim 1, wherein said substrate comprises an insulating layer.
3. The manufacturing method as claimed in claim 2, wherein said insulating layer is silicon dioxide (SiO_2).
4. The manufacturing method as claimed in claim 1, wherein said silicide layer on said polysilicon comprises a barrier, a tungsten layer and a silicon nitride (SiN_x) layer in sequence.
5. The manufacturing method as claimed in claim 4, wherein said barrier is titanium nitride (TiN).
6. The manufacturing method as claimed in claim 1, wherein said silicide structure is defined by an anisotropic dry etcher.
7. The manufacturing method as claimed in claim 1, wherein said protecting layer is formed by chemical vapor deposition (CVD).

8. The manufacturing method as claimed in claim 1, wherein said protecting layer has a thickness ranged from 50 to 500 Å.
9. The manufacturing method as claimed in claim 1, wherein said protecting layer is silicon nitride (SiN_x).
10. The manufacturing method as claimed in claim 1, wherein said protecting structure is defined via an anisotropic dry etcher.
11. The manufacturing method as claimed in claim 1, wherein said polysilicon structure is defined via an anisotropic dry etcher.
12. The manufacturing method as claimed in claim 1, wherein said insulating structure is formed via a dry oxidation.
13. A manufacturing method of said protecting structure covering said side wall of said silicide structure, comprising:
 - (a) providing a substrate;
 - (b) forming a polysilicon layer and a silicide layer upon said substrate;
 - (c) removing a part of said silicide layer for defining a silicide structure having a side wall;
 - (d) forming a protecting layer upon said polysilicon layer and covering said silicide structure;
 - (e) removing a contact crosspiece between said protecting layer and said polysilicon layer and between said protecting layer and said silicide structure to form a protecting structure;
 - (f) removing said polysilicon layer not covered by said silicide structure and said protecting structure for obtaining a polysilicon structure having laterals; and
 - (g) oxidizing said polysilicon structure for forming an insulating structure on laterals of said polysilicon structure.

14. The manufacturing method as claimed in claim 13, wherein said silicide layer on said polysilicon comprises a barrier, a tungsten layer and a silicon nitride (SiN_x) layer in sequence.
15. The manufacturing method as claimed in claim 14, wherein said barrier is titanium nitride (TiN).
16. The manufacturing method as claimed in claim 13, wherein said silicide structure is defined by an anisotropic dry etcher.
17. The manufacturing method as claimed in claim 13, wherein said protecting layer is formed by chemical vapor deposition (CVD).
18. The manufacturing method as claimed in claim 13, wherein said protecting layer has a thickness ranged from 50 to 500 Å.
19. The manufacturing method as claimed in claim 13, wherein said protecting layer is silicon nitride (SiN_x).
20. The manufacturing method as claimed in claim 13, wherein said protecting structure is defined via an anisotropic dry etcher.
21. The manufacturing method as claimed in claim 13, wherein said polysilicon structure is defined via an anisotropic dry etcher.
22. A polycide gate structure, comprising:
 - (1) a polysilicon structure formed upon said substrate and having laterals;
 - (2) an insulating structure disposed on said laterals of said polysilicon structure for insulating said polysilicon structure;
 - (3) a silicide structure formed upon said polysilicon structure and having laterals; and
 - (4) a protecting structure disposed on said laterals of said silicide structure of protecting said silicide structure.
23. The structure as claimed in claim 22, wherein said insulating layer is silicon

dioxide (SiO_2).

24. The structure as claimed in claim 22, wherein said silicide layer upon said polysilicon layer comprises a barrier, a tungsten layer and a silicon nitride (SiN_x) layer in sequence.
25. The structure as claimed in claim 24, wherein said barrier is titanium nitride (TiN).
26. The structure as claimed in claim 22, wherein said protecting layer is formed by means of chemical vapor deposition (CVD).
27. The structure as claimed in claim 22, wherein said protecting layer has a thickness ranged from 50 to 500 Å.
28. The structure as claimed in claim 22, wherein said protecting layer is silicon nitride (SiN_x).
29. The structure method as claimed in claim 22, wherein said polysilicide structure is defined via an anisotropic dry etcher.
30. The structure as claimed in claim 22, wherein said insulating structure is formed by means of a dry oxidation method.
31. The structure as claimed in claim 22, wherein said polycide structure is defined via anisotropic dry etcher.
32. The structure as claimed in claim 22, wherein said protecting structure is defined via an anisotropic dry etcher.